II. EXISTING CONDITIONS

EXISTING TRANSPORTATION FEATURES

The Study Team conducted an extensive data collection effort to gain an understanding of existing conditions in the study area. In addition to collecting data for the quantitative assessment of existing conditions, the Study Team conducted field evaluations throughout the study area during peak and off-peak hours to further assist in the assessment of existing conditions. This section of the report summarizes the data collected for the study and addresses issues and deficiencies in the transportation infrastructure.

MAJOR ROADWAYS IN THE STUDY AREA

The study area is located in Northwest Washington, DC and is shown in Figure 1. The following are the major roadways in the study area:

- Connecticut Avenue
- Reno Road
- Tilden Street
- Albemarle Street
- Van Ness Street

While some of the studied roadways continue beyond the above terminals, their associated characteristics will only be described within these limits.

Connecticut Avenue

Connecticut Avenue[1] is a two way major arterial[2] running north-south through the study area. There is a total of six lanes on Connecticut Avenue with a reversible lane in operation during the AM and PM peak periods. As shown in Figure 2, Connecticut Avenue operates with four southbound and two northbound lanes during weekdays from 7:00-9:30 AM and four northbound and two southbound lanes during weekdays from 4:00-6:30 PM. No parking is allowed on Connecticut Avenue during AM and PM reversible lane operation. During off peak hours and weekends, Connecticut Avenue operates as two-lanes in each direction with parking allowed on both sides of the road. There are parking meters on both sides of Connecticut Avenue from Albemarle to Van Ness Street and on the west side of Connecticut from Van Ness to Tilden Street. The posted speed limit is 30 mph. There is no median on Connecticut Avenue.

[1] All streets in the study area are located in the northwest quadrant of the District. Therefore, throughout this report where the NW designation is omitted, it should be understood that the street is located in the northwest quadrant of the District.

[2] All roadway classifications were taken from the District of Columbia Functional Classification Map, January 1, 2002.

Click to View:

2. Existing (2002) Peak Period Lane Configurations

The intersections of Connecticut Avenue with Albemarle Street, Yuma Street, Windom Place, Veazey Terrace, Van Ness Street, and Tilden Street are signalized intersections, while the intersection of Upton Street is un-signalized intersection with stop control on the minor street. Sidewalks are generally in good condition, with widths greater than six feet and curb cuts present at all crosswalk locations.

As shown in Figure 3, land usage along Connecticut Avenue varies widely based on location. From Albemarle Street to Van Ness Street is moderate density commercial area with local public facilities at the corner of Van Ness Street. The Van Ness Metro station is located on the west side of Connecticut Avenue at Van Ness Street. East of Connecticut are high-density residential areas.

Reno Road

Reno Road is a two-way minor arterial running north-south through the study area between Tilden and Albemarle Streets. Reno road is generally one lane in each direction with a center lane for left turns. From Van Ness to Tilden Street, there are two lanes in each direction (Figure 2). No parking is allowed on either side of Reno Road within the study area. The intersections of Reno Road with Tilden, Van Ness and Albemarle Streets are signalized intersections while the intersection of Reno road with Yuma Street is stop-controlled on the minor street. The posted speed limit on Reno Road is 25 mph. The west side of Reno Road has six-foot sidewalks from Albemarle Street to Upton Street while the east side has six-foot intermittent sidewalks from Yuma to Warren Streets, and from Veazey to Tilden Street. Sidewalks are generally in good condition.

Land usage along Reno Road is primarily low-density residential along the west side of Reno Road and the east side from Albemarle Street to Veazey Street. The east side of Reno Road, from Veazey to Tilden Street is foreign embassy property.

Tilden Street

Tilden Street is a two-way, two-lane minor arterial running east-west through the study area between Linnean Avenue and Reno Road. There is one lane in each direction. All-day parking is permitted on both sides of the street between Reno Road and 28th Place. Parking is not allowed on the north side of Tilden Street from Linnean Avenue to 28th Place. Tilden Street has a landscaped center median from Linnean Avenue to Sedgwick Street. The intersection of Tilden Street with Linnean Avenue is stop-controlled on the minor street, while the intersections of Tilden Street with Connecticut Avenue and Tilden Street with Reno Road are signalized. The posted speed limit is 25 mph. Both sides of the road have sidewalks, which are generally six feet in width.

Click to View:

3. Generalized Land Use Map

As shown on Figure 3, land usage along Tilden Street varies widely based on location. From Linnean Avenue to the east side of Connecticut Avenue is low-density residential usage, with a high-density residential area near the Connecticut Avenue intersection. The north side of Tilden Street from Connecticut Avenue to Reno Road includes several embassies and the south side includes parks or open space.

Albemarle Street

Albemarle Street is a two-way collector running east-west between Linnean Avenue and Reno Road in the study area. The posted speed limit is 25 mph. Albemarle Street generally operates with one lane in each direction with the exception of two lanes in each direction at the Connecticut Avenue intersection (Figure 2). From Linnean Avenue to 35th Street no parking is allowed on the south side of Albemarle Street. However, all day parking is allowed on the north side of Albemarle Street from 35th Street to Linnean Avenue, and both sides of the road from 35th Street to Reno Road. Signalized intersections along this portion of Albemarle Street include Connecticut Avenue and Reno Road. The intersection with Linnean Avenue is all-way stop controlled. Sidewalks are six feet wide on average and generally in good condition.

Land usage along Albemarle Street is primarily low-density residential, with high-density residential and moderate density commercial at the intersection of Albemarle Street and Connecticut Avenue.

Van Ness Street

Van Ness Street is a two-way road running east-west from Reno Road to the east of Connecticut Avenue. West of Connecticut Avenue, Van Ness Street is classified as a collector. It is a local road to the east of Connecticut Avenue. The posted speed limit is 25 mph. Van Ness Street operates with one lane in each direction from the east side of Connecticut Avenue with parking allowed on both sides of the road. To the west, from Connecticut Avenue to Reno Road, Van Ness Street operates with one lane in the westbound direction and two lanes in the eastbound direction. Metered parking is located on the north side of Van Ness Street between Connecticut Avenue and International Court. Signalized intersections along Van Ness Street are Connecticut Avenue and Reno Road. Sidewalks on both sides of the road between Reno Road and Connecticut Avenue are generally eight feet wide, while sidewalks east of Connecticut Avenue are generally six feet wide. Sidewalks are generally in good condition with curb cuts visible in all crosswalk locations.

Land usage along Van Ness Street varies widely based on location. On the east side of Connecticut Avenue, Van Ness Street is institutional with high-density residential and moderate-density commercial area near Connecticut Avenue. On the west side of Connecticut Avenue, land usage is predominantly public and federal facilities, with the UDC-Van Ness campus at the corner of Van Ness Street and Connecticut Avenue.

PUBLIC TRANSPORTATION

The Washington Metropolitan Area Transit Authority (WMATA) provides extensive bus and rail service in the study area. As shown in Figure 4, four routes (L1, L2, L4, and D32) provide north-south service to the study area, operating primarily along Connecticut Avenue. In addition, route H2 provides service from the Van Ness-UDC metro station to the south on Connecticut Avenue. Route H3 serves the west side of the study area along Veazey Street, Van Ness Street and Reno Road. Route N8 operates from the Metro station to the west along Veazey and Van Ness Streets. The Van Ness-UDC station of the Metro Red Line is located on Connecticut Avenue at Veazey Street. Access to the station is provided on both sides of Connecticut Avenue.

Bus routes operating in the study area are as follows[1]:

WMATA Route L1, L2, L4 – Connecticut Avenue Line

Routes L1, L2, L4 operate on Connecticut Avenue and are the major bus routes for traveling north-south through the study area. During weekdays, L2 provides service throughout the day with southbound service operating from 5:05 AM until 1:35 AM. Northbound service operates from 5:39 AM until 2:08 AM. Southbound L1 operates only during the morning rush hour from 6:58 AM until 8:37 AM, and southbound L4 starts its operation after the end of morning peak hour from 9:15 AM until 8:14 PM. Northbound L1 operates only during afternoon peak hours from 4:12 PM till 6:05 PM, and northbound L4 operates from 8:31 AM until 8:43 PM.

In the study area, southbound headways range from 6 minutes to 35 minutes, with AM peak period headways varying from 6 to 9 minutes, and PM peak period headways ranging from 8 to 12 minutes. Northbound headways range from 5 to 38 minutes, with AM peak period headways varying from 7 to 15 minutes, and PM peak period headways ranging from 5 to 10 minutes.

On Saturdays and Sundays only route L2 operates. It runs between morning and midnight with varying headways between 12 and 40 minutes. The most prevalent headway is 20 minutes.

WMATA Route N8 – Van Ness-Wesley Heights Loop

Route N8 operates as a loop from the Van Ness –UDC campus to Wesley Heights. The outbound route serves Veazey Street from Reno Road to Wisconsin Avenue, while the inbound route operates on Van Ness Street. The loop provides service from 5:57 AM until 12:08 AM during weekdays with headways range from 18 minutes to 50 minutes. AM and PM peak headways are constant, operating 18 minutes apart.

[1] Routes and headways based on WMATA schedules published between 12/30/01 and 9/29/02.

Click to View:

4. Public Transit

Route N8 also runs on Saturday from 5:50 AM until 12:22 AM and on Sunday from 6:20 AM until 11:00 PM. Headways are approximately 45 minutes to 50 minutes apart for Saturday and Sunday operation.

WMATA Routes H2, H3 – Crosstown Line

Route H2 runs on Connecticut Avenue in the study area with outbound headways during AM peak period ranging from 21 to 31 minutes, while PM peak period headways range from 24 to 33 minutes. Inbound headways range from 23 minutes to 31 minutes during the AM peak period and 27 minutes to 31 minutes during PM peak hours. Weekend service is offered on this route.

Route H3 runs on Reno Road, Veazey Street and Van Ness Street on the west side of the study area, with westbound service available only in morning peak hours, and eastbound service available in morning and afternoon peak hours. Headways during the westbound AM peak period range from 22 to 27 minutes. Eastbound headways range from 50 minutes to 54 minutes during AM peak period and 21 minutes to 31 minutes during PM peak period. Weekend service is not offered on this route.

WMATA Route D32 – Deal Junior High School Line

Route D32 operates only when District public schools are in session. It runs northbound on Connecticut Avenue twice daily at 8:03AM and 8:08AM. In the afternoon, it operates along Wisconsin Avenue outside the study area.

TRAFFIC VOLUMES

In order to evaluate existing traffic conditions throughout the study area, the Study Team collected turning movement counts at the thirteen intersections listed below during peak and off-peak periods. Additionally, the Study Team collected daily traffic counts at key locations throughout the study area. Figure 5 shows the intersections where the Study Team collected turning movement count data.

1. Reno Road and Albemarle Street
2. Reno Road and Yuma Street
3. Reno Road and Van Ness Street
4. Reno Road and Tilden Street and Springland Lane
5. Connecticut Avenue and Albemarle Street
6. Connecticut Avenue and Yuma Street
7. Connecticut Avenue and Windom Place
8. Connecticut Avenue and Veazey Terrace
9. Connecticut Avenue and Van Ness Street
10. Connecticut Avenue and Upton Street
11. Connecticut Avenue and Tilden Street
12. Linnean Avenue and Albemarle Street
13. Linnean Avenue and Tilden Street

Click to View:

5. Location of Turning Movement Counts

The intersections on Connecticut Avenue were counted on four typical weekdays (Tuesday, Wednesday or Thursday), from 8:00 AM -10:00 AM and 4:30 PM - 8:00 PM. Additionally, these intersections were counted on four Saturdays between the times of 12:00-4:00 PM.

Counts were taken during the months of November and December 2002 and January 2003. No traffic was counted during holiday weeks or while District public schools and universities were not in session.

Since all the counts were taken during fall months, when traffic volumes are typically standard as all the schools and business are open, no seasonal adjustment factor was applied to the raw volumes.

As all the intersections in Connecticut Avenue were counted four times, the turning movement traffic counts on Connecticut Avenue were averaged and treated as raw volumes. Because of the averaging process, there were minor discrepancies in the overall balance of traffic volumes throughout the study area network. In order to improve the modeling of existing traffic conditions, the Study Team applied standard traffic engineering techniques to adjust the turning movement counts at intersections where minor unjustified imbalances were found. Figure 6 represents the existing 2002 balanced AM and PM weekday peak hour turning movement counts at all 13 intersections. Figures 7 and 8 provide information on additional traffic data collected on Connecticut Avenue. These are weekday evening (6:30- 7:30 PM) peak hour and Saturday midday peak hour turning movement counts, respectively. Accompanying pedestrian counts are presented in Figures 9, 10 and 11 for weekdays, evenings and Saturdays, respectively. Appendix B presents raw vehicular and pedestrian volumes for all counts at the above thirteen intersections.

As shown in the turning movement count figures, the intersections in the study area with the highest turning movement volumes can be found along Connecticut Avenue, with the intersection of Van Ness Street and Connecticut Avenue the highest overall. Intersections along the periphery of the study area along Reno Road and Linnean Avenue have lower traffic volumes. The pedestrian volume figures show that, as expected, high pedestrian volumes are found along Connecticut Avenue. The highest number of pedestrians for weekdays and Saturdays can be found at Windom Place and Connecticut Avenue, the intersection closest to the Metro station.

The Study Team collected automated Average Daily Traffic (ADT) counts over a two-week period throughout November 2002 at the following four locations:

- Connecticut Avenue between Albemarle Street and Yuma Street
- Connecticut Avenue between Veazey Terrace and Windom Place
- Connecticut Avenue between Tilden Street and Upton Street
- Van Ness Street west of Connecticut Avenue

Click to View:

6. 2002 Existing Weekday Peak Hour Volumes

Click to View:

7. 2002 Existing Weekday Evening (6:30 – 7:30 PM) Volumes

Click to View:

8. 2002 Existing Saturday Peak Hour Volumes

Click to View:

9. 2002 Existing Weekday Peak Hour Pedestrian Volumes

Click to View:

10. 2002 Existing Weekday Evening (6:30 – 7:30 PM) Pedestrian Volumes

Click to View:

11. 2002 Existing Saturday Peak Hour Pedestrian Volumes

Connecticut Avenue carries approximately 40,000 vehicles per day during a typical weekday[1] and 34,000 vehicles on Saturdays. The daily traffic on Van Ness Street on a weekday is 11,000 vehicles. Saturday daily volumes are slightly less than weekday volumes but significantly higher than Sunday daily volumes.

Charts 1 and 2 show average daily traffic volumes, for weekdays and Saturdays respectively, at one of the four locations where average daily traffic volumes were recorded. Charts for the remaining three locations are presented in Appendix B. As shown in Chart 1, traffic levels on Connecticut Avenue during the AM peak hour are higher than the traffic during the PM peak hour. During the weekday AM peak period, traffic between 8:00 AM to 9:00 AM is consistently higher than during other hours of the peak period. Weekday peak traffic conditions during the PM peak period are maintained over a period of several hours. As indicated in Chart 2, the peak period for Saturdays is between 12:00 PM and 6:00 PM with volumes relatively constant throughout this entire peak period.

Automated vehicle classification counts taken over a two-week periods on Van Ness Street west of Connecticut Avenue indicate that approximately six percent of average weekday traffic is comprised of heavy vehicles (buses, semi-trucks, etc.). Weekend percentages of heavy vehicles are in the range of three to four percent.

Between the hours of 7:00 AM and 7:00 PM, the classification data indicates that Connecticut Avenue volume is approximately two percent heavy vehicles.

SPEED AND TRAVEL TIMES

In order to gain an understanding of driving patterns and to gather information needed in the development of the traffic model for the study area, the Study Team collected information on speed and travel times on key corridors in the study area. The Study Team collected the data on travel times and delay on January 16, 2003.

Study Team data collectors drove the Connecticut Avenue, Tilden Street, Reno Road, Albemarle Street and Van Ness Street corridors several times in each direction during both the AM and PM peak hours, and recorded the elapsed travel times at predetermined travel points and the distance between the selected travel points. For the travel time runs, the data collectors were instructed to drive at the same speed as most of the vehicles traversing the study area. Thus, in some sections of the critical corridors, the data collectors traveled at speeds above the speed limit.

The Study Team calculated average speed for each roadway segment as well as an overall average speed for the corridor using the data collected on travel times and distances

[1] Total 24-hour traffic volume in both directions.

Click to View:

Chart 1. Weekday Hourly Distribution of Vehicular Trips – Connecticut Avenue North of Veazey Terrace

Click to View:

Chart 2. Saturday Hourly Distribution of Vehicular Trips – Connecticut Avenue North of Veazey Terrace

between time points. Figures 12 and 13 present overall travel times and speeds for the key corridors for AM and PM peak hours, respectively. Due to signal coordination, the Connecticut Avenue corridor (from Sedgwick street to Albemarle street) has higher southbound speeds in the morning, and higher northbound speed in the afternoon peak hour. Eastbound Tilden Street speed is consistently higher in AM and PM peak hour than the westbound direction. Speeds on Albemarle Street are generally consistent regardless of time period, with the exception of westbound Albemarle Street from 36th street to Reno Road, which has a considerably slower segment speed. However, eastbound Albemarle Street has higher average speed than westbound Albemarle Street for the AM and PM peak hour. Average speeds on northbound Reno Road are approximately twice the speed of southbound Reno Road for the AM and PM hour. Van Ness Street speeds are consistent regardless of peak hours; however, eastbound speeds are higher than westbound speeds. For individual segments, speeds in the segment of Van Ness Street between International Drive and Reno Road are noticeably slower than all other segments.

These travel times include signal delay, and therefore due to traffic signals along most of the corridors, as well as moderate to heavy peak period traffic volumes, overall average speeds are considerably slower than the speed limits of the roadways. However, there are individual sections on all of the corridors (except westbound Albemarle Street and Southbound Reno Road) where average speeds met or exceeded the speed limit, as can be seen in Table 1. In particular, traffic traveling on Connecticut Avenue northbound between Upton and Tilden Streets; eastbound Albemarle Street between Connecticut Avenue and 30th Street; Tilden Street eastbound between 29th Street and Linnean Avenue; Reno Road northbound between Yuma Street and Albemarle Street; and Van Ness Street eastbound between International Court and International Drive exceeded the speed limit by a noticeable amount.

Table 1
Average Travel Speeds Between Selected Locations

Roadway and Direction	Segment	Speed Limit (mph)	AM Peak (mph)	PM Peak (mph)
Connecticut Avenue northbound	Tilden Street – Upton Street	30	32.2	36.1
Connecticut Avenue southbound	Upton Street – Tilden Street	30	32.2	11.0
Albemarle Street eastbound	Connecticut Avenue – 30th Street	25	31.8	29.5
Albemarle Street westbound	30th Street – Connecticut Avenue	25	17.2	20.3
Tilden Street eastbound	29th Street – Linnean Avenue	25	33.5	30.2
Tilden Street westbound	Linnean Avenue – 29th Street	25	26.2	22.9
Reno Road northbound	Yuma Street – Albemarle Street	25	38.8	34.9
Reno Road southbound	Albemarle Street – Yuma Street	25	15.4	30.1
Van Ness Street eastbound	International Court – International Drive	25	38.0	37.2
Van Ness Street westbound	International Drive – International Court	25	37.2	27.1

Appendix C presents a list of recorded speeds for all analyzed segments within the Study Area.

Click to View:

12. AM Peak Period Travel Times

Click to View:

13. PM Peak Period Travel Times

ORIGIN-DESTINATION PATTERNS IN THE STUDY AREA

In order to gain an understanding of existing traffic patterns in the study area, the Study Team conducted a comprehensive assessment of origins and destinations for vehicles entering and exiting the study area during the AM and PM peak period. The origin-destination survey helped identify the travel patterns of all vehicles entering the study area during the peak hours.

DATA COLLECTION FOR ORIGIN-DESTINATION SURVEY

The data collection effort for the origin-destination survey encompassed the following tasks:

1. Recording of license plates at all major entry and exit points of vehicles entering and exiting the study area: survey personnel (surveyors) recorded license plate data, state and number, onto tape recorders at the locations shown in Figure 14 on November 14, 2002.
2. Recording of missed vehicles: if a surveyor could not get the license plate of a vehicle, he/she was instructed to note the vehicle as a "missed" to have control totals that could be used for the expansion of the survey data.
3. Transcription of license plate records: surveyors entered the state and license plate data for each location onto a computerized database.

DATA PROCESSING FOR ORIGIN-DESTINATION SURVEY

Study Team staff used the license plate database to match entering and exiting vehicles. The Study Team made the following assumptions in the database matching process:

1. Based on field observations, 35 percent of unmatched volumes at entry and exit points were assumed to have entered or exited the study area via streets where license plate data was not collected.
2. Based on the high number of residential units in the study area, during the AM peak period, remaining unmatched exiting vehicles with DC license plates were assumed to originate their trips in the study area. During the PM peak period, remaining unmatched entering vehicles with DC license plates were assumed to terminate their trips in the study area.
3. Missed vehicles have the same travel patterns as vehicles for which origin origin-destination matches were found.

In the first step of the license plate matching process, the Study Team developed a "raw" origin-destination trip matrix based on existing license plates that matched entering license plates. This raw origin-destination matrix excluded unmatched vehicles and missed vehicles. In the second step, the Study Team used the assumptions listed above to determine a "total" origin-destination trip matrix for all vehicles entering and exiting the study area.

Click to View:

14. License Plate Survey Locations for Origin-Destination Study

TRIP MATRICES AND FINDINGS OF ORIGIN-DESTINATION SURVEYS

Tables 2 and 3 present the results of the vehicle matching for the study area during the AM peak period (6:45AM – 9:15AM). The matrix of origins and destinations shown in Table 2 are the totals for all vehicles and include adjustments to account for unmatched and missed vehicles[1]. The main findings of the origin-destination survey results for the AM peak period are:

- Approximately 17 percent of the vehicles exiting the study area originate their trips within the study area.
- As shown in Figure 15, a majority of southbound vehicles entering the study area had Maryland license plates.
- Likewise, a majority of southbound vehicles exiting the study area had Maryland license plates.
- The location where Virginia vehicles represented the highest percentage of entering vehicles was eastbound Van Ness Street at Reno Road.
- 47 percent of vehicles destined for the study area enter the study area via southbound Connecticut Avenue at Albemarle Street
- The exit locations with the highest percentage of trips that started within the study area are eastbound Tilden Street at Linnean Avenue and westbound Albemarle Street at Reno road, each with 37 percent of their overall exiting traffic originating within the study area.
- The most used roadway in the study area is Connecticut Avenue.
- The majority of trips entering the study area via westbound Tilden Street at Linnean Avenue exit the study area at one of the exit locations along Reno Road; very few of these trips exit on Connecticut Avenue.
- With the exceptions of traffic entering the study area on eastbound Van Ness Street or westbound Tilden Street, a majority of vehicles tended to exit the study area on the same road on which they entered.

Tables 4 and 5 present the results of the vehicle matching for the study area during the PM peak period (3:00 PM – 5:30 PM). The matrix of origins and destinations shown in Table 4 includes the adjustments to account for unmatched and missed vehicles[1]. The main findings of the origin-destination survey results for the PM peak period are:

- Approximately 33 percent of the total number of vehicles exiting the study area originate their trips within the study area.
- Twenty percent of all trips bound for the study area entered on northbound Connecticut Avenue at Sedgwick Street, the highest percentage of any entry point. Northbound Reno Road at Tilden Street was the second-most used, with nineteen percent.
- As shown in Figure 16, more vehicles from Maryland entered the study area at northbound and southbound Connecticut Avenue than from any other individual state.

[1] The unadjusted "raw" origin-destination matrices are included in Appendix G.

Click to View:

Table 2. Total Origin-Destination Trips During the AM Peak Hours (6:45 AM – 9:15 AM)

Click to View:

Table 3. Total Origin-Destination Trips During the AM Peak Hours (6:45 AM – 9:15 AM) as Percentage of Exit Volumes

Click to View:

15. AM License Plate Distribution

Click to View:

Table 4. Total Origin-Destination Trips During the PM Peak Hours (3:00 PM – 5:30 PM)

Click to View:

Table 5. Total Origin-Destination Trips During the PM Peak Hours (3:00 PM – 5:30 PM) as Percentage of Exit Volumes

Click to View:

16. PM License Plate Distribution

- Likewise, Maryland vehicles represented a majority of northbound traffic exiting the study area.
- All other entry and exit points had a higher percentage of DC vehicles than any other state.
- More than one half of the exiting traffic at each individual location originated within the study area.
- The most used roadway in the study area is Connecticut Avenue.
- Forty-two percent of all vehicles exiting the study area on northbound Connecticut Avenue entered the study area on Connecticut Avenue. Additionally, 42 percent of vehicles exiting the study area on southbound Connecticut Avenue entered the study area on Connecticut Avenue.
- Thirteen percent of traffic exiting the study area on eastbound Tilden Street at Linnean Avenue entered the study area on southbound Connecticut Avenue. This is unexpected compared to the AM pattern, where a relatively small percentage of traffic exiting on Tilden Street entered on Connecticut Avenue.

SAFETY

In order to assess safety conditions in the study area, the Study Team obtained accident data from DDOT for all principal and minor arterials, collectors and local roads inside the study area, for the years from 1999 through 2001. Based on the information summarized in Table 6, there was a total of 165 reported accidents in the study area involving 69 injuries. More than 90% of the reported accidents and injuries occurred on Connecticut Avenue. There were three head on collisions in the study area, all of which occurred on Connecticut Avenue. The high number of accidents on Connecticut Avenue can be attributed in part to the reversible lane operation, high volume of traffic and the relatively high speed at which vehicles travel on this roadway.

As the information in Table 6 indicates, the intersection of Connecticut Avenue and Tilden Street experienced the highest number of accidents in the study area, with 30 during the three analyzed years. Rear end, left-turn and side-swiped were the most common types of accident at this intersection. A head-on collision was reported on this intersection. The high number of accidents at this intersection indicates that enhancements to signing and signalization at this location may be needed to improve the safety of traffic operations.

Twenty-four accidents were reported at the intersection of Connecticut and Yuma, with 10 sideswiped and seven rear end accidents. Twenty-two accidents were reported at Connecticut and Van Ness, with sideswipes as the most common type. Twenty-one accidents were reported at both Connecticut and Windom Place and Connecticut and Upton Street. Sideswipe was the most common type of accident at Windom Place whereas left-turn was the most common at Upton Street. One head-on collision was also reported at Windom Place. Numbers of accidents on the remainder of Connecticut Avenue include Albemarle Street with 16 accidents, Sedgwick Street with 12 accidents, and Veazey Terrace with six accidents. As

Table 6
Summary of Accident Data

Intersection	Total Number of Accidents (Injuries)			AM Peak Hour Percentage			PM Peak Hour Percentage			Off-Peak Percentage			Accident Type(s) (1999-2001)
	1999	2000	2001	1999	2000	2001	1999	2000	2001	1999	2000	2001	
Connecticut Avenue and Ablemarle Street	3 (1)	6 (0)	7 (4)	33	0	0	33	17	14	33	83	86	Head On - 1 Left Turn - 1 Other - 3 Parked - 2 Pedestrian - 1 Rear End - 6 Side Swiped - 2
Connecticut Avenue and Yuma Street	6 (4)	11 (5)	7 (3)	17	18	29	33	36	57	50	46	14	Left Turn - 4 Rear End - 7 Right Angle - 2 Side Swiped - 10
Connecticut Avenue and Windom Place	5 (3)	9 (2)	7 (3)	20	33	43	20	11	29	60	56	28	Fixed Object - 1 Left Turn - 1 Non-Collision - 1 Other - 4 Pedestrian - 2 Rear End - 5 Side Swiped - 7
Connecticut Avenue and Veazey Terrace	3 (1)	N/A	3 (2)	0	N/A	0	33	N/A	0	67	N/A	100	Fixed Object - 1 Other - 2 Rear End - 2 Side Swiped - 1
Connecticut Avenue and Van Ness Street	2 (1)	9 (5)	11 (5)	50	22	18	0	33	9	50	45	73	Left Turn - 2 Other - 3 Parked - 2 Pedestrian - 1 Rear End - 2 Right Angle - 3 Side Swiped - 9
Connecticut Avenue and Upton Street	8 (3)	7 (2)	6 (2)	12	0	33	38	29	17	50	71	50	Fixed Object - 2 Head On - 1 Left Turn - 6 Other - 2 Parked - 4 Right Angle - 5 Side Swiped - 3
Connecticut Avenue and Tilden Street	7 (7)	11 (5)	12 (3)	29	18	17	0	0	58	71	82	25	Fixed Object - 1 Head On - 1 Left Turn - 8 Other - 1 Parked - 2 Rear End - 9 Right Angle - 3 Side Swiped - 5
Connecticut Avenue and Sedgwick Street	4 (0)	2 (2)	6 (4)	25	0	0	25	50	33	50	50	67	Fixed Object - 1 Left Turn - 2 Other - 1 Parked - 2 Rear End - 3 Right Angle - 1 Side Swiped - 2
Reno Road and Albemarle Street	1 (0)	N/A	1 (0)	0	N/A	0	0	N/A	0	100	N/A	100	Right Angle - 2
Reno Road and Yuma Street	N/A	1 (1)	N/A	N/A	0	N/A	N/A	0	N/A	N/A	100	N/A	Right Angle - 1
Reno Road and Van Ness Street	N/A	N/A	3 (0)	N/A	N/A	0	N/A	N/A	0	N/A	N/A	100	Left Turn - 1 Rear End - 1 Right Angle - 1
Reno Road and Tilden Street	2 (0)	1 (1)	1 (0)	0	0	0	0	100	100	100	0	0	Fixed Object - 2 Side Swiped - 2
Linnean Avenue and Albemarle Street	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Linnean Avenue and Tilden Street	1 (0)	N/A	2 (0)	0	N/A	0	0	N/A	0	100	N/A	100	Fixed Object - 2 Rear End - 1

N/A: Not Available
Complete DCDPW Accident Summary Reports can be found in Appendix D

the table indicates a large proportion of the accidents on Connecticut Avenue intersections occurred during AM and PM peak periods. During these hours, the reversible lane operations are in effect at these locations. The high number of side-swiped accidents during the peak hours may be attributable to the reversible lane operation of Connecticut Avenue. Fewer than four accidents were reported at any intersection on Reno Road and Linnean Avenue for the years 1999 to 2001.

Pedestrian accidents occurred at the intersections of Connecticut Avenue and Albemarle Street, Connecticut Avenue and Windom Place and Connecticut Avenue and Van Ness Street. Based on pedestrian observation and counts, a relatively high number of pedestrian use these intersections. While no pedestrian accidents were reported at the other critical intersections in the study area, pedestrian safety issues were observed at some intersections. These issues are described in the next section of this report. Detailed accident data is presented in Appendix D.

QUEUES AT CRITICAL INTERSECTIONS

The Study Team collected information on existing queues – the number of vehicles lined up at an intersection during the red phase of a traffic signal – at critical intersections in the study area. This information was needed to adequately develop a computerized simulation model of existing traffic conditions. The Study Team observed AM and PM peak hour queues for each of the approaches of all the critical intersections inside the study area. The Study Team calculated the maximum queues for all of the approaches. Figure 17 summarizes the observed maximum queues for all the critical intersections. Based on the observation, southbound Connecticut Avenue generally forms longer queues than northbound Connecticut Avenue during the AM peak hour. Also AM period queues are higher than the PM peak period queues on Connecticut Avenue due to more highly concentrated AM peak period traffic. The longest queues were observed on southbound Reno Road at Van Ness Street during AM peak hour.

Westbound Van Ness Street at Reno Road had the longest observed queues during the PM peak hour. The study team observed significantly long queues at Northbound Reno Road at Tilden Street during AM peak hour. Another location with long queues is westbound Tilden Street at Connecticut Avenue.

The Study Team used the queuing information to develop the existing conditions traffic model. The queues of the traffic simulations were compared with the observed queues. Where the Study Team found significant discrepancies between modeled conditions and observed conditions, the input data used to set up the model was thoroughly examined to eliminate the possibility of errors in the development of the model. After errors were ruled out, discrepancies were reconciled by making adjustments to the traffic model parameters to make the model replicate more accurately observed traffic conditions.

Click to View:

17. Observed Queues at Studied Intersections

PARKING INVENTORY

The study team performed a detailed parking inventory for the entire study area. As shown in Figure 18, parking restrictions vary along the corridors based on surrounding land. For example, no parking is allowed at metered parking locations on Connecticut Avenue between 7:00 AM and 9:30 AM and from 4:00 PM until 6:30 PM. These hours coincide with reversible lane operation on Connecticut Avenue. No parking is allowed on Reno Road throughout the study area. Non-metered parking locations throughout the study area are signed as three-hour residential parking from 7:00 AM – 8:30 PM, Zone 3 excepted.

The study team recorded parking utilization on all study area roadways for four different time periods on a typical weekday during January 2003. The four periods are AM peak period from 8:30 AM-9:30 AM, AM off peak period from 10:00 AM-12 noon, PM off peak period from 2:00 PM–3:30 PM, and PM peak period from 4:00PM-5:30 PM. As metered parking on Connecticut Avenue is not allowed during AM and PM peak periods, no parking utilization inventory was performed on Connecticut Avenue during peak periods. Detailed information of parking utilization on different periods for the study area is available on Appendix E.

There are 50 parking meters on southbound Connecticut Avenue from Albemarle Street to Tilden Street, and 17 parking meters on northbound Connecticut Avenue from Van Ness Street to Albemarle Street. There are no parking meters on northbound Connecticut Avenue from Sedgwick Street to Van Ness Street; however, parking is available during off peak hours. In addition to Connecticut Avenue, metered parking is found on Van Ness Street from Connecticut Avenue to International Drive, 36th Street from Reno Road to Yuma Street, Yuma Street from 35th Street to Connecticut Avenue, and Windom Place in the vicinity of Connecticut Avenue. Parking is limited to two hours at these meters.

Parking utilization is very high on southbound Connecticut Avenue from Albemarle Street to Sedgwick Street during AM and PM off peak periods except for the ten parking meters from Upton Street to Tilden Street where the utilization rate is very low. Parking utilization on northbound Connecticut Avenue from Sedgwick Street to Albemarle Street is moderate to very high during AM and PM off peak hours. In addition to on-street parking, there are privately owned, off-street parking facilities on Connecticut Avenue between Albemarle Street and Van Ness Street.

Parking utilization was very high during the survey periods on westbound Albemarle Street from 30th Street to 36th Street and eastbound Albemarle Street from 36th Street to 35th Street. However, parking utilization is low on Albemarle Street east of 30th Street and west of 36th Street. All the metered parking on Yuma Street was at or near capacity during the survey periods due to its proximity to Connecticut Avenue. Eastbound Yuma Street parking between 35th Street and the beginning of metered parking is at full capacity throughout the day, however, parking utilization is moderate to very low west of 35th Street. Parking utilization is very low to moderate on 36th Street during the entire survey period. In addition, most of the parking meters on northbound 36th Street were not used

Click to View:

18. Daytime Parking Restrictions

throughout the day. Parking utilization rates were very high on both sides of Van Ness Street east of Connecticut Avenue. All 43 metered parking spaces on westbound Van Ness Street from Connecticut Avenue to International Drive were occupied during the survey periods. Parking spaces were full on both sides of Upton Street from Connecticut Avenue to 29th Street throughout the entire day. Parking utilization was moderate to very high on both sides of Tilden Street from 29th Street to Reno Road.

In general, parking utilization is very high on and near Connecticut Avenue, where the greatest parking-generating land uses are located. The parking utilization rate reduces from moderate to low as one travels further away from Connecticut Avenue.

While on-street parking utilization is very high on and near Connecticut Avenue, there does not appear to be any need to supplement the existing parking available in the immediate area. During peak parking demand periods, parking spaces on side streets – where parking utilization is moderate to low – are used as a supplement to the available parking resources on and near Connecticut Avenue.

EXISTING LEVELS OF SERVICE

The Consultant used SYNCHRO, a traffic modeling/analysis program, to evaluate existing traffic conditions in the study area. For the evaluation, the Consultant entered existing traffic volumes, lane configurations, pedestrian volumes and signal timings into SYNCHRO to develop a base case, existing conditions model. SimTraffic, SYNCHRO's associated traffic simulation software, was used to assist in the development of a model that accurately replicates existing conditions.

The Consultant used the SimTraffic software results to calculate levels of service (LOS) and the delay per vehicle for the thirteen intersections in the study area. All of the intersections except Reno Road at Yuma street, Connecticut Avenue at Upton Street, Albemarle Avenue at Linnean Avenue, and Tilden Street at Linnean Avenue are signalized intersections. The LOS evaluation uses a six-letter grade scale (A to F) to rank the overall traffic handling ability of an intersection or a network based on delay/vehicle. LOS A indicates excellent traffic operations with minimal delays. LOS F represents failing conditions with long delays. Levels of service E and F are generally considered undesirable. Appendix F provides a description of the different levels of service and their associated delays for both signalized and unsignalized intersections.

The Consultant analyzed Connecticut Avenue traffic for AM and PM peak hour, while reversible lane operation is in effect on Connecticut Avenue. In addition, traffic was also analyzed for weekday evening peak (6:30 – 7:30 PM) and the Saturday midday peak hour, when Connecticut Avenue operates with two lanes in each direction with parking allowed on both sides of the road.

As seen in Figure 19, during the AM peak hour all the intersections on Connecticut Avenue operate at LOS C or better except the intersection of Connecticut Avenue and Tilden Street, which operates at LOS D with long westbound queues. LOS D indicates

Click to View:

19. Existing AM and PM Peak Hour Levels of Service (LOS)

that the existing traffic volumes are approaching the capacity at the intersection and traffic delays are approaching undesirable levels. In addition, all the peripheral signalized intersections in the study area operate at LOS D except Reno Road and Tilden Street, which operates at LOS F.

During the PM peak hour all intersections on Connecticut Avenue operate at LOS D or better except the intersections with Tilden Street and Van Ness Street, which operate at LOS E and F, respectively. Van Ness Street has long queues for eastbound left turns, whereas Tilden Street has long westbound queues. In addition, all peripheral signalized intersections along Reno Road in the study area operate at LOS D or better.

The intersections on Connecticut Avenue were also analyzed during weekday evening (6:30 PM – 7:30 PM) and Saturday peak hours, as shown in Figure 20. The intersections of Connecticut Avenue with Veazey Terrace and Van Ness Street are operating at LOS E during the evening peak hour with long queues in all directions. All other intersections on Connecticut Avenue operate at LOS D or better during the same time period. Since parking is allowed on both sides of Connecticut Avenue during evening hours and weekends, the reduction in the number of available traffic lanes and the friction between parking and through vehicles reduces the capacity of the roadway and affects traffic operations. The Saturday peak hour analysis indicates that all intersections on Connecticut Avenue operate at LOS D or better. In some cases spill back traffic was observed in both directions of Connecticut Avenue between Albemarle Street and Van Ness Street during evening and Saturday peak hours.

The Consultant used the existing levels of service to identify locations where future improvements - such as signalization, changes in signal timing/phasing and additional lanes – could be implemented. These issues are described in Section IV of this report.

Click to View:

20. Existing Evening and Saturday Peak Hour Levels of Service (LOS)